

1.0 MODIFIED BITUMEN ROOFING SAFETY CONDITIONS AND SAFETY MEASURES

1.1 SAFETY CONDITIONS

- 1) Contractors are required to maintain a **TWO (2) HOUR MINIMUM FIRE WATCH** at the end of each working day, after open flame roofing application methods have been utilized. All roof areas worked shall be checked for hot spots and signs of smouldering.
- 2) Caution should be taken when working around roof openings, penetrations or flashing. Extreme caution should be exercised when working around exhaust vents that may have grease or lint accumulations. Such accumulations should be cleaned before roofing work is started.
- 3) Torches should be used according to manufacturers' instructions. Torch stands should be used to direct flame upward when momentarily not in use. Torches should not be used near gas lines, electrical wires or flammable liquids. All equipment should be inspected regularly and kept in good working order.
- 4) Contractor should have adequate fire extinguishing equipment. A minimum of five 20-lb. multi-purpose dry chemical extinguishers is suggested. There should be at least one fire extinguisher within 20 ft. horizontal travel distance of any torch-applied roofing equipment. For larger roof areas, additional protection such as charged hose lines or additional extinguishers may be required. (Contractor should be made aware of the location of fire hoses if they are available. Outside faucets from "domestic" water supply may also be useful.)
- 5) **No propane or combustible liquids** are to be left on site and/or any roof areas after roofing crews vacated the work site at the end of the day.
- 6) **All equipment** used for roofing applications must be either removed from the work site at the end of working shifts or the equipment must be secured and rendered immovable and inaccessible, "as is reasonable" to vandals.
- 7) The site is to be secured using all barricades, and/or other materials as are necessary to enclose and isolate the site.
- 8) **In all modified bituminous membrane roofing applications, a "PEEL and STICK" membrane must be used as the first ply stripping on all combustible wall surface areas where fire damage may occur.**
- 9) All other normal site safety concerns, that are either stated elsewhere within this specification, and/or are required and/or implied by others, are to form part of the safety requirements.

**1.0 MODIFIED BITUMEN ROOFING
(CONTINUED)****SAFETY CONDITIONS AND SAFETY
MEASURES (CONTINUED)****1.2 SAFETY CONDITIONS**

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| 1. | .1 | Observe and enforce construction safety measures required by Part 8 of NBC 1990, Provincial Government, Work Safe BC of B.C. and municipal statutes and authorities. | Construction Safety |
| | .2 | In event of conflict between any provisions of above authorities the most stringent provision will apply. | |
| | .3 | Ensure no part of work is subjected to a load which will endanger its safety or will cause permanent deformation. | |
| 2. | .1 | Comply with all Provincial and local Fire Safety Regulations. The section 5.0.1 Safety Precautions – Torching published in the Roofing Contractors Association of B.C. “Roofing Practices Manual” form part of this Specification. | Fire Safety |
| 3. | .1 | The Contractor shall comply fully with all WHMIS (Workplace Hazardous Materials Information System) requirements. In addition, provide to the Owner, prior to commencement of the work, one complete set of current MSDS (Material Safety Data Sheets) for all materials to be used on this job site. | WHMIS Requirements |

2.0 MODIFIED BITUMEN ROOFING**SAFETY PRECAUTIONS**

1. Modified bitumen roofing membranes represent the latest in the evolution of bituminous roofing systems. However, some systems require that applicators use a propane-fueled open flame torch to adhere the membrane. When working with an open flame on the construction site, applicators must use extreme caution to prevent accidents. Carelessness could lead to loss of property or life.

Torching

This section contains precautions for applying modified bitumen roofing. The applicator will find proper procedures for working with equipment of the jobsite, and dealing with personnel.

NOTE: If a fire occurs for any reason, call the Fire Department immediately, even if you put out the flames. Some material may smoulder for hours before bursting into flames, and could be smouldering in places where the layman may not think to look. Let the fire fighters do their job. Safety is no accident.

2. .1 Applicators use an open flame to soften the bitumen of the underside of the membrane to make it adhere to the roofing substrate. At a temperature of 1100°C (2000°F), the flame produced by liquid propane gas does an excellent melting job. But used incorrectly or carelessly, the flame could damage the roof or the buildings and seriously injure the applicator.

Equipment

Applicators should receive training in proper application, maintenance and safety procedures when handling torching equipment.

Operators should handle their equipment carefully. Protect the soft brass valve of the gas cylinder. It is easy to crack or break it. A broken valve could turn the cylinder into a torpedo. Check all cylinders before refilling. Never overfill a cylinder. It could explode.

All applicators of modified bitumen should participate in the safety and training program.

**2.0 MODIFIED BITUMEN ROOFING
(CONTINUED)****SAFETY PRECAUTIONS
(CONTINUED)**

2. .2 a) Use well-built durable products that feature safety devices and are listed by Underwriters Laboratories of Canada (ULC).
- b) Follow the Manufacturer's safety and operating instructions provided with the torch system.
- c) Check all equipment for wear. Repair and/or replace as necessary.
- d) Use soap solution to test for gas leaks before lighting, then check for the proper operation of the torch.
- e) Check all fittings and other equipment on the applications equipment for leakage.
- f) Be sure that torch equipment is in good working order and that the cylinder valves are clean.
- g) Stop work and shut off flame if propane odour is detected.
- h) Stop work and make repairs if a leak occurs.
- i) Keep non-applicators at least 3 m (10') from the flame.
- j) Protect your equipment: store it in a tool box.
- k) Do not use matches or cigarette lighter to test for gas leaks.
- l) Containers which hold or may have held flammable material must be kept clear of the torch or other heat sources.
- m) Do not use equipment that has been damaged or that is in need of repair.

General

**2.0 MODIFIED BITUMEN ROOFING
(CONTINUED)****SAFETY PRECAUTIONS
(CONTINUED)**

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| 2. | .3 a) | Protect cylinder valves; where possible use cylinders that have valve protection welded to the cylinder. | Tanks |
| | b) | Propane tanks are pressurized – do not puncture or subject to extreme heat. | |
| | c) | Secure propane tanks in an upright position and place them at least 3 m (10') from the open flame. | |
| | d) | Increase the size of the bottle or cylinder to keep frosting from occurring. | |
| | e) | Close the propane cylinder valve first and let the remaining gas burn out of the hose before closing the torch valve when shutting off the torch. | |
| | f) | Plug the valve with a plastic plug when cylinder is not in use. | |
| | g) | Do not turn a vapour cylinder on its side to increase pressure – liquid could escape. | |
| | h) | Do not heat a cylinder to increase pressure. | |
| | i) | Do not fill gas cylinder or bottle in need of repair. | |
| | j) | Do not tighten the brass fittings too tightly with a wrench. | |
| 2. | .4 a) | Use an adjustable ULC listed regulator with the torch. | Regulators |
| | b) | Make sure flow of gas through the regulator is in the proper direction. Directional flow is stamped on regulator. | |
| | c) | Keep vent in pressure regulator clear at all times. | |
| | d) | Use a pressure gauge on every regulator. | |

2.0 MODIFIED BITUMEN ROOFING (CONTINUED)**SAFETY PRECAUTIONS
(CONTINUED)**

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| 2. | .4 e) Do not use an adjustable regulator with a higher pressure range than the one that came with the torch. | Regulators (Continued) |
| | f) Do not operate any pressure gauge beyond the top of its scale or near excessive heat (above 65 Celsius) or where there is excessive vibration. | |
| | g) Do not use equipment without an operating pressure gauge. | |
| 2. | .5 a) Check hoses for wear and tear. | Hoses |
| | b) Use only hoses listed for liquid propane gas. | |
| | c) Use less than 15 m (50') of hose at one time. | |
| 2. | .6 a) Use an adjustable pilot light with a complete shut-off. | Torches |
| | b) Use a torch stand to direct flame upward when not in use. | |
| | c) Use only torch machines equipped with the same safety features as described for torches. They should also have individually adjustable torches. Use only torch trolleys and multiple head machines with approved safety valves. | |
| | d) Ignite burner with a flint or electronic lighter. Matches or disposable lighters are unsafe substitutes. | |
| | e) Treat the torch as if it is always burning. On bright days it is very hard to see the flame, and when working around mechanical equipment, it is impossible to hear the torch operating. | |
| | f) Be very careful when working with torches in areas where you cannot see. Pull material away, heat it, and then apply it to the flashing. | |
| | g) Do not leave lighted torch unattended. | |
| | h) Do not lay an operating torch over the edge of a roof. | |

2.0 MODIFIED BITUMEN ROOFING (CONTINUED)**SAFETY PRECAUTIONS
(CONTINUED)**

2. .6 i) Do not use a trowel as a torch stand. Torches (Continued)
- j) Do not lay an operating torch to rest on a gas cylinder. If there is a gas leak in the cylinder area, there could be a fire.
- k) Do not play with a torch. A flame can be hard to see on a bright day and can ignite skin or clothing instantly.
2. .7 a) Have at least one Class ABC fire extinguisher within 6 m (20') of each worker using the torch. Extinguishers
- b) Train each worker in the proper use of the fire extinguishers.
- c) Direct the stream from a dry chemical-type fire extinguisher at the base of the fire from a distance of at least 3 m (10'). Sweep the fire away from you, starting at its nearest point and moving the chemical stream toward the farthest point.
- d) Do not try to put out a cylinder fire if it cannot be done without tipping the cylinder. Let it burn and call the Fire Department.
- e) Do not place fire extinguisher too close to liquid propane gas equipment. If fire results, you may not be able to get at fire extinguisher to put out the fire.
2. .8 Each building is different from every other building, and each roof design presents a new set of challenges to the Roofing Contractor. The applicator of modified bitumen systems must adapt his standard safety procedures to meet the special requirements of the current job. However, roofers should follow the basic rules presented in these pages. BUILDINGS

2.0 MODIFIED BITUMEN ROOFING (CONTINUED)**SAFETY PRECAUTIONS
(CONTINUED)**

2. .8 (Continued)

The job supervisor should take extra care when working on the modified bitumen roofing job. The supervisor should walk the job one hour after all torches have been extinguished. The delay will help guard against a smouldering fire going undetected at the end of the work day. Check for potential “hot spots” – especially cants, wall flashings, and around penetrations such as vent pipes, intake vents and skylights.

Applicators must take special care when torching at flashings, corners, or voids in the roof deck. Never torch directly at these locations. Always torch the membrane and then adhere it to the corner or joint.

BUILDINGS (CONT'D)

2. .9 a) Install metal flashing on penetrations or flashings with a tight fitting felt collar before torching.

General

b) Shut down air conditioning units, exhaust fans and air intake fans in the work area at the roof control.

c) Do not work in an enclosed area where gas can accumulate.

2. .10a) Use perlite, fiberglass, or concrete cant strips if cant strips are required.

Substrates

b) Use glass or organic base sheet on all wood decks and over flammable insulation, cant strips or other flammable surfaces.

c) Look for any void, hole or gap in substrate and fill with non-combustible or perlite cant strip.

d) Use a base ply over all flammable insulation surfaces and edges and over all joints between rigid insulation boards. The base ply provides a protective covering for underlying combustibles.

e) Install a base ply or a layer of roof insulation, acceptable to the membrane manufacturer, to separate polyurethane or polyisocyanurate roof insulation from the modified sheet and the torch.

**2.0 MODIFIED BITUMEN ROOFING
(CONTINUED)****SAFETY PRECAUTIONS
(CONTINUED)**

2. .10f) Install a base ply over all flammable surfaces and rigid board insulations. Be sure base ply fits tightly around all roof deck openings and turns up the wall, so the flame cannot flash down and start a fire underneath the deck.
- g) Do not torch to wood fiber insulation, cant strip, wood or any flammable material.
2. .11a) Follow the Manufacturer's recommendations on torching to insulation and recover board surface.
- b) Use a small torch when flashing near details.
- c) Shield air conditioning units and other protrusions with perlite panels or similar material when using the torch around them.
- d) Heat the membrane away from air conditioning units, fans, soil pipes and all other protrusions. Care must be taken to avoid flame being pulled into the building interior.
- e) Feather seams around details with hot trowel, not open flame.
- f) Heat membrane and then attach to flashings, corners, or voids in the roof deck. Never torch directly.
- g) Use caution when torching near pipes in the event there is suction present.
- h) Do not torch anything you cannot see such as under air conditioning units or behind counter flashing.
- i) Do not torch near gas lines or near electric wires (such as around roof top equipment, etc.).
- j) Do not torch around flammable vents or plastic projections.

Substrates (Continued)

Torching Methods

2.0 MODIFIED BITUMEN ROOFING (CONTINUED)**SAFETY PRECAUTIONS
(CONTINUED)**

2. .11k) Do not point the torch under roof top equipment.
- l) Do not point the torch down open roof penetrations.
 - m) Do not point the torch into corners or roof edges where dried wood or fiber may ignite (such as wood blocking or cant strip).
 - n) Do not point the torch at low flashings where there is an overhang and flame could get up under the counter flashing, such as around skylights or prefabricated curbs with fiberboard sidewall insulation.
 - o) Do not apply modified bitumen products directly over exposed conduits or pipes lying on the roof deck.
 - p) Avoid prolonged contact with heat sensitive metals such as lead, as overheating of these metals could ignite underlying flammable services.
 - q) Do not lay an operating torch directly onto the membranes – there is danger both of fire and of damaging the membrane.
 - r) Do not lay an operating torch on an open penetration on the roof. If the penetration is part of an air intake system, the flames could be sucked into the building.

Torching Methods

2. .12 Many construction-industry tradesmen use open flames or flame tools in their jobs. Heating and air conditioning contractors, welders and plumbers all use open flame at the job site. These professionals are responsible for the safe use of their tools, just as the roofing contractor is responsible for the safe application of the modified bitumen roofing systems.

Personnel

**2.0 MODIFIED BITUMEN ROOFING
(CONTINUED)****SAFETY PRECAUTIONS
(CONTINUED)**

2. .12 (Continued)
Contractors must not only train their own men in using open flame application, but must also make sure the general contractor and his superintendents are familiar with the necessary safety precautions for using torch application of roofing membrane.
- Some of the safety precautions will be considered unpleasant, such as wearing long-sleeve shirts and long pants in the summer, but the results, - a safe, injury-free job site – are worth the effort.
2. .13a) Wear proper clothing: non-synthetic fabrics, long-sleeve shirt, long pants, boots, gloves and proper eye protection.
- b) Keep non-applicators at least 3 m (10') from open flame.
- c) Train, instruct, and warn employees on the use or torching equipment.
- d) Use extra caution around edges of insulation board. Cover exposed edges with inflammable base ply to prevent flame from coming in contact with any flammable material. Contact for any length of time with lead or other materials affected by heat should be avoided.
- e) Do not take anything for granted. Be on guard against lapses in on-the-job safety.
2. .14 For years Fire Departments have been learning the proper safety precautions necessary to prevent fires. Their expertise and assistance should be utilized whenever possible to supplement a company's safety training program. By making the local fire department a part of your team, you are giving notice that in all cases Safety Comes First.

Personnel (Continued)

General

Fire Department

**2.0 MODIFIED BITUMEN ROOFING
(CONTINUED)****SAFETY PRECAUTIONS
(CONTINUED)**

2. .15a) Strict compliance with local fire codes must be maintained.
- b) Give written notice to the local Fire Department where required, and obtain any necessary permits.
- c) The required number of fire extinguishers shall be on the roof at all times. They shall be Class ABC extinguishers of the size specified by the local fire code; one per each torch operator.
- d) Install portable smoke detectors in attics as required by the local Fire Department.
- e) Foremen on the job shall have fire safety training and shall remain at job site at least one hour after the application has ended for the day.
- f) No flammable liquids shall be stored or used on the roof excluding liquid propane gas in approved containers. All liquid propane gas not in use shall be stored on the ground.

Fire Department Recommendations

REPORT ALL FIRES TO THE FIRE DEPARTMENT, EVEN THOSE THAT ARE EXTINGUISHED QUICKLY. THERE MAY STILL BE FIRE AND/OR SMOULDERING IN AREAS WHERE A LAYMAN MAY NOT THINK TO LOOK.

3.0 PROJECT INSTRUCTIONS**GENERAL**

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| 1. The Bidders shall attend the site to inspect the projects and to familiarize themselves with the work to be performed, and to provide all contingencies which may be required to complete the Specifications as submitted and as required. | Site Inspection |
| 2. The location of existing features has been determined from available records, but is not guaranteed. The location of all such features shall be investigated and verified in the field by the Contractor. | Existing Features |
| 3. The Contractor shall obtain permits, pay all fees therefore, and comply with all Provincial and Municipal and other legal regulations and By-laws as applicable to the Work. If no local regulations, comply with the National Building Code of Canada, latest revision. | Permits, Regulations |
| 4. All materials shall be new unless specific written approval has been given by Specifying Authority for any component. | New Materials |
| 5. All work must be continuous from start to completion as to be negotiated and agreed upon between the Owners, Contractor, and Roofing Consultant, with crews of adequate size and experience prior to start of Work. | Sequence of Work |
| 6. All material, roofing or otherwise to be installed by qualified "BC licensed trades people". Roofing crews to have a minimum of seventy (70%) percent journeymen with past experience applying the products specified. | Qualification of Trades People |
| 7. Manufacturer's certification of crew members confirming past experience may be required prior to start-up of Work. | Manufacturer's Certification of Crew Members |
| 8. The Contractor is NOT to start Contracts as agreed by the Owner, Roofing Consultant and the Roofing Contractor prior to submission of signed Agreement. | Commencement of Work |

3.0 PROJECT INSTRUCTIONS (CONTINUED)**GENERAL**

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| 9. | .1 | Upon completion, submit to Owners a ten (10) year RCABC Guarantee. | GUARANTEES / WARRANTIES 10 Year RCABC Guarantee |
| | .2 | Upon completion, the Membrane and/or Sheet Metal Manufacturer, care of the "Roofing Contractor", to provide Owners with a written ten (10) year Guarantee for membrane manufacturer defects including granule loss. | Membrane Manufacturer's Warranty |

Note: Copies of the Guarantees / Warranties are to be submitted to the Owner for approval and acceptance prior to the finalization of the Contractual Documents.

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| 10. | .1 | All inspections are to be on a daily basis. | Quality Control Inspections |
| | .2 | All occurrences on-site are to be documented in the Daily Reports and include photos. | |
| | .3 | All extras and changes to work are to be confirmed by the Owner's Representative prior to the work being done. | |
| | .4 | Should workmanship deficiencies and / or deficiency repairs require more inspections than contracted for, these Extra Costs will be deducted from the Contract. | Quality Control Payment |

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| 11. | .1 | It is intended that the Contractor attends the site during normal daytime working period and no restriction will be made on the general continuity of his Work. If a major restriction on operation is required due to unforeseen circumstances, it shall be recorded and signed for by the Owner' Representative and subject to additional costs | GENERAL Daily Working Period |
| | .2 | The Contractor shall ensure that the Work is carried out in such a way as to inconvenience as little as possible the proper functioning of the premises. | |

3.0 PROJECT INSTRUCTIONS (CONTINUED)**QUALITY CONTROL**

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| 12. | Parking for workmen employed on the Work shall be restricted to the area assigned for the purpose by the Owner's Representative having jurisdiction. | Parking |
| 13. | .1 Access to buildings' roofs is to be confirmed by Owner's Representative. .2 Access to the interior of the structure is to be supplied as required to perform work as related to this Contract ONLY. | Access |
| 14. | Contractor is to provide all on-site sanitary requirements. | Sanitary Facilities |
| 15. | The Contractor shall make provisions with the Owner for domestic power and/or provide generators as required. | Electrical Power |
| 16. | Provide, maintain and remove on completion, hoardings, barriers and warning signs for the protection of workmen and the public as required and approved by the Specifying Authority. All the necessary precautions shall be taken to protect the public at all times. No hoisting or lowering of roofing materials will be permitted in areas accessible to the public or employees. | RELATED WORK Work Area Safety |
| 17. | Provide protection at all times against weather so as to maintain work, material, equipment and property free from injury or damage and, as necessary, ensure work is carried out expeditiously in accordance with agreed time schedule and completion date. | Climatic Conditions |
| 18. | .1 The Roofing Contractor to protect existing road, paving, buildings, finished surfaces, equipment, trees, lawns, utilities, heating, lighting, power, and telephone services during the Work and to make good, repair or replace any damage to Owner's approval. .2 The Roofing Contractor to include in his Tender for the protection of the existing gutters, rain water leaders and other related components. | Protection |

3.0 PROJECT INSTRUCTIONS (CONTINUED)**RELATED WORK**

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| <p>19. All damage during the performance of the work to the interior or exterior structure or grounds, walls, sidewalks, surrounding properties, etc, is to be cleaned or repaired to the satisfaction of the Owner.</p> | <p>Damage</p> <p>Work Area Safety</p> |
| <p>20. This Contractor shall maintain the site in as clean a condition as possible, to the satisfaction of the Consultant during his work daily, and shall remove from this and the surrounding properties any debris from his work on the completion of the job. Failure to do this will result in this cleaning and removal being instituted by the Owner and the related costs, plus Owner's management time costs, will then be deducted from the amount owing this Contractor.</p> | <p>Clean-Up</p> |
| <p>21. All roof areas to be made water-tight as soon as possible before proceeding. No roofing areas to be removed which are greater in area than can be made water-tight under climatic conditions existing at the time.</p> | <p>Water-tight</p> |
| <p>22. .1 All demolished material to be carefully contained and removed by approved means from roof surfaces in order of procedure. Demolished materials are to be deposited in secure and tarped containers.</p> <p>.2 Disposal containers are to be located in only those areas that do not interfere with the daily operations of the facility.</p> <p>.3 All disposal containers must be cordoned off utilizing ultra-visible combination of caution flags and ropes; to meet Work Safe BC standards regarding public safety.</p> <p>.4 No stock piling of roofing debris on existing roofs or grounds will be permitted.</p> <p>.5 To prevent fire and / or vandalism, disposal containers are to be removed from the site immediately upon filling and to be tarped and secured if partially filled and left overnight. All related liability will be included in the Contractor's responsibilities.</p> | <p>DEMOLITION, DEBRIS AND DISPOSAL</p> |

3.0 PROJECT INSTRUCTIONS (CONTINUED)**RELATED WORK**

- .6 Common areas surrounding the work site must be kept clean at all times. **Daily clean-up and disposal of all debris is MANDATORY.**
23. Prior to the installation of any new roofing system, the roof deck is to be evaluated to verify that its condition is capable of supporting the new system.
24. .1 All existing nails are to be removed or hammered in flush to deck surface.
- .2 All lumber to be re-nailed as and if required, to provide a solid, smooth surface for the installation of the new overlay system.
25. All roof top units, plumbing, electrical, phone, gas, etc. disconnections and reconnections, both labour and materials are to be included in this Tender. All materials and work are to be to acceptable trade standards and Building Code.
26. All plumbing, electrical, gas, phone, etc, damage due to penetration of screws, nails, etc, to be replaced to the original standards as required, to the satisfaction of the Owner and to comply with Municipal / Provincial Code Standards. Cost of repairs to be included in this Tender.
27. Curbs and all components to be disconnected and reconnected, as required to facilitate the work.
28. All exhaust ventilation pipes and plumbing pipes are to be extended, as and if required, to comply with the current requirements of the BC Building Code; all costs to be included in this Tender.

PROCEDURE

Existing Decks' Condition

Existing Deck Preparation

Utilities Disconnections / Reconnections

Screw and / or Nail Penetration
InstructionsHeat / Air Vents
Disconnections / Reconnections

Existing Decks

4.0 SCOPE OF WORK:

1. The Contractor shall furnish all labour, materials and equipment necessary to remove and dispose of existing roof system to the deck, to remove and dispose of existing sheet metal flashing, drains, plumbing vents stacks and “B” vents, etc., unless otherwise stated in this Specification. Cap flashings are to be retained for re-use. Remove and retain for re-use pre-formed metal roof panels and associated flashings. Further to re-work all areas as required by the written Specifications, Roof Plans and Details as required to complete as intended. Removal, Disposal & Preparation

2. The Contractor to furnish all labour, materials and equipment deemed necessary to install new two ply SBS modified membrane systems, plus sheet metal flashing, drains, and other components, etc., as required by written Specifications, Details and Roof Plan as required to complete as intended. Further, install vapour barrier to steep slope roofs and re-install pre-formed metal roof panels. Installation

3. Only those products listed, in the following preamble of components, are acceptable for use in this Specification. Inclusion of a non-specified product(s) may result in the rejection of the affected work. Correction of the rejected work shall be undertaken at no cost to the Owners and to the satisfaction of the Consultant. Acceptable Products

5.0 TWO-PLY MODIFIED BITUMEN ROOFING**PROJECT INSTRUCTIONS & MATERIALS**

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| <p>1. .1 The Contractor shall furnish all labour, materials and equipment necessary to remove and dispose of existing roof system to the deck, to remove and dispose of existing sheet metal flashing, drains, plumbing vents stacks and “B” vents, etc, unless otherwise stated in this Specification. Further, to re-work all areas as required by the written Specifications, Roof plans and Details as required to complete as intended.</p> <p>.2 Remove and retain sheet metal roof panels and associated flashings for re-use.</p> <p>.3 Remove and retain sheet metal cap flashings for re-use except at balcony railing.</p> | <p>Preparation of the Existing Substrate</p> |
| <p>2. .1 All plumbing vent stacks are to have new flanged copper and / or aluminum sleeves complete with settle caps. All sizes, to be compatible with existing copper, are to be brazed or silver soldered only, aluminum is to be welded. Vent flashing sleeves are to have a 6” wide retainer flange with pre-punched holes for securement at 4” on center.</p> <p>.2 All flanges to be set in trowel coat of S.B.S. mastic and secured to deck with screws.</p> | <p>Plumbing Vents</p> |
| <p>3. .1 All new vents, etc. to be set on 8” wood curbs, and stripped as required. Further, to be complete with new galvanized iron sheet metal hoods and collars, post painted to match sheet metal flashings.</p> <p>.2 Existing gas chimney cap flashings are to be retained for re-use.</p> <p>.3 Apply two (2) coats of rust resistant paint, Tremclad or equal. Colour to match existing cap flashings.</p> <p>.4 Any chimney cap flashings that are dished are to have wood blocking installed to support the flashing.</p> | <p>Heat / Air Vents and Gas Chimneys</p> |

**5.0 TWO-PLY MODIFIED BITUMEN ROOFING
(CONTINUED)****PROJECT INSTRUCTIONS &
MATERIALS (CONTINUED)**

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| <p>4. .1 All walls are to be sealed with stripping plies and flashings.</p> <p>.2 <u>NOTE: Self adhesive membrane stripping must be used on all interior combustible wall surfaces.</u> Preheating, only, of this stripping membrane is allowed. No open flame application is to be used on any combustible interior wall surface directly above roofed area.</p> | <p>Interior Wall Stripping Sheet Metal</p> |
| <p>5. Prepare to provide a suitable flat surface to facilitate insulation adhesion and prime with a full black coat.</p> | <p>Existing Decks</p> |
| <p>6. Retaining the structure water-tight is to be included in the Tender.</p> | <p>Water-tight</p> |
| <p>7. Nail permaboard at 12" on center to deck and perimeter walls, with large head nails. Tape all joints in permaboard and at horizontal / vertical transitions and penetrations.</p> | <p>PERMABOARD (OR EQUAL) Installation Procedure</p> |
| <p>8. All roofing systems are to contain two (2) plies of membrane with two plies of stripping. All membranes are to be supplied from the same Manufacturer. System is as follows:</p> <p>.1 First ply membrane is to be 3.0 mm, 180 g/m² non-woven polyester fleece, top and bottom surfaces polythene coated. The first ply membrane is to be relaxed and fully torched to the permaboard.</p> <p>.2 First ply membrane stripping (torch applied) is to be 3.0 mm, 180 g/m², non-woven polyester fleece, both top and bottom surfaces are polythene coated.</p> <p>.3 Second ply membrane and second ply stripping (torch applied) is to be 4.0 mm, 250 g/m², non-woven polyester fleece, top surface covered with ceramic granules, bottom surface covered with thermofusible film, suitable for torch welding. CGSB 37 GP56M, Type 1, Class A, Grade 2.</p> | <p>Modified Bituminous Membrane and Stripping Applications</p> |

**5.0 TWO-PLY MODIFIED BITUMEN ROOFING
(CONTINUED)****PROJECT INSTRUCTIONS &
MATERIALS (CONTINUED)**

- | | |
|---|--|
| <p>8. .4 All stripping plies are to be mechanically fastened to structure <u>immediately upon installation</u> with roofing nails at 18" on center at minimum.</p> <p>.5 All deficiencies in installed membranes and stripping plies are to be <u>corrected prior to installation of the next ply.</u></p> <p>.6 All SBS '180' and '250' gram membranes are to be unrolled, heated (if required) and allowed to relax prior to installation. (See Typical Details this Specification.)</p> <p>.7 All tradesmen installing membranes are to be certified by the Manufacturer prior to start of installations. Certifications are to be issued to the Consultant and the Owners' Representative in writing.</p> | <p>Modified Bituminous Membrane and Stripping Applications</p> |
| <p>9. Construction grade, free of deterioration, to conform to site requirements, Roof Plans, written Specifications and Details.</p> | <p>Wood</p> |
| <p>10. .1 To be drill and pins, galvanized and of the appropriate length.</p> <p>.2 Large head Simplex Nails, length as required.</p> <p>.3 Oversize, Neoprene bonded, washer, hex head, self-tapping screws. Colour to match metal roof panels.</p> | <p>Fasteners</p> |
| <p>11. 50/50 lead.</p> | <p>Solder</p> |
| <p>12. To be Schnee-Morehead SM7100 (or equal) colour to match materials in use.</p> | <p>Caulking</p> |
| <p>13. Mastic, compatible to S.B.S. modified bitumen membranes.</p> | <p>Mastic</p> |

**5.0 TWO-PLY MODIFIED BITUMEN ROOFING
(CONTINUED)**

**PROJECT INSTRUCTIONS &
MATERIALS (CONTINUED)**

14. .1 Three (3”) inch copper, complete with strainers.

DRAINS

.2 4 lb sheet lead.

Sheet Lead

15. Include shop formed copper gum pans, plus two part rubberized pourable sealer, plus E.P.D.M. wrap secured with clamps for all gas and electrical protrusions.

Gas / Electrical
Protrusions

**6.0 MODIFIED BITUMEN ROOFING /
SHEET METAL FLASHING****PROJECT INSTRUCTIONS &
MATERIALS**

1. No amount of roofing is to be removed that cannot be re-roofed to Specifications the same day.
2. At the eave edge, install a 12" strip of self-adhering membrane, terminating 1 1/2" over the eave edge and 9 1/2" up the slope. Over the membrane strip, install the specified sheet metal drip edge flashing, securing with galvanized screws at 12" O.C. Install self-adhering membrane to 100% of the roof area. Membrane to terminate a minimum of 4" up vertical surfaces.
3. All perimeter sheet metal flashings and related roof components are to be 24 G.G.I.B.E. and fabricated and installed as per the ten (10) year RCABC Guarantee Criteria.
4.
 - .1 All metal shall have proper allowances for expansion and contraction.
 - .2 No lap joints will be permitted.
 - .3 All metal to be joined by double 'S' lock clips, single 'S' locks, standing seams or continuous clips (see Typical Details).
 - .4 All cap flashing top surfaces and corners to be secured using standing seams. Inside and outside fascia corners to be secured with double 'S' locks.
 - .5 All joints are to be caulked both prior to and after connections.
 - .6 All exposed edges of flashings shall be hemmed to form drip edges.
 - .7 All metal to be firmly attached to structure with compatible wood or metal screws.
 - .8 'Dutchman' clips and other exposed fasteners are NOT to be used.

Procedure

Membrane / Flashing

SHEET METAL

6.0 MODIFIED BITUMEN ROOFING / SHEET METAL FLASHING (CONTINUED)**PROJECT INSTRUCTIONS & MATERIALS (CONTINUED)**

- | | | |
|-----|---|----------------------------|
| 4. | .9 All Sheet Metal Details are to be approved by Roofing Consultant prior to manufacture. | SHEET METAL (CONTINUED) |
| | .10 Peel off any strippable film on flashings as they are installed. | |
| | .11 Touch-up all minor scratches and spots with compatible paint, as recommended by the panel Manufacturer. | |
| 5. | Remove and dispose of all debris resulting from work under this Section, to the satisfaction of the Owner(s) or the designated Representative. | Debris |
| 6. | Galvanized Iron Screws as required. | |
| 7 | Metal panel fasteners shall be corrosion-resistant, galvanized screws sufficient in length to secure to the decking and as recommended by the panel Manufacturer. | Fasteners |
| 8. | .1 Factory finished metal roof panel and related flashings to comply with the standard stock range of DURANAR® High-Performance Fluoropolymer Coatings (PVDF) produced with 70% Kynar 500 ® or Hylar 5000® Resin, or Cascadia, Duracoat XT-205, or Vic West, Colorite, or approved equal. | Finishes |
| | .2 Touch-up paint: As issued by the Manufacturer for this purpose. | |
| 9. | .1 In-seam sealants: Schnee-Morehead SM 5420 or approved equal. | Caulking |
| | .2 Exposed sealants: Schnee-Morehead SM 7100 or approved equal. | |
| 10. | Clips: Formed 22 gauge galvanized steel shapes specifically designed to engage and retain, without exerting excess pressure on the roofing panels and / or related flashings. | Clips |

**6.0 MODIFIED BITUMEN ROOFING / SHEET
METAL FLASHING (CONTINUED)**

**PROJECT INSTRUCTIONS &
MATERIALS (CONTINUED)**

11. Underlayment: loose lay of one ply SopraGlass 40 (or equal), plus tape all perimeters and protrusions with fireguard tape, in lieu of taping mainfield, side and butt of rigid board. Note: taping of perimeters and protrusions to remain included in Tender.

Underlayment
Fire Prevention Alternate

12 .1 Aluminum plumbing vent stack flashings as approved by metal panel Manufacturer and the Design Authority.

Plumbing Stacks

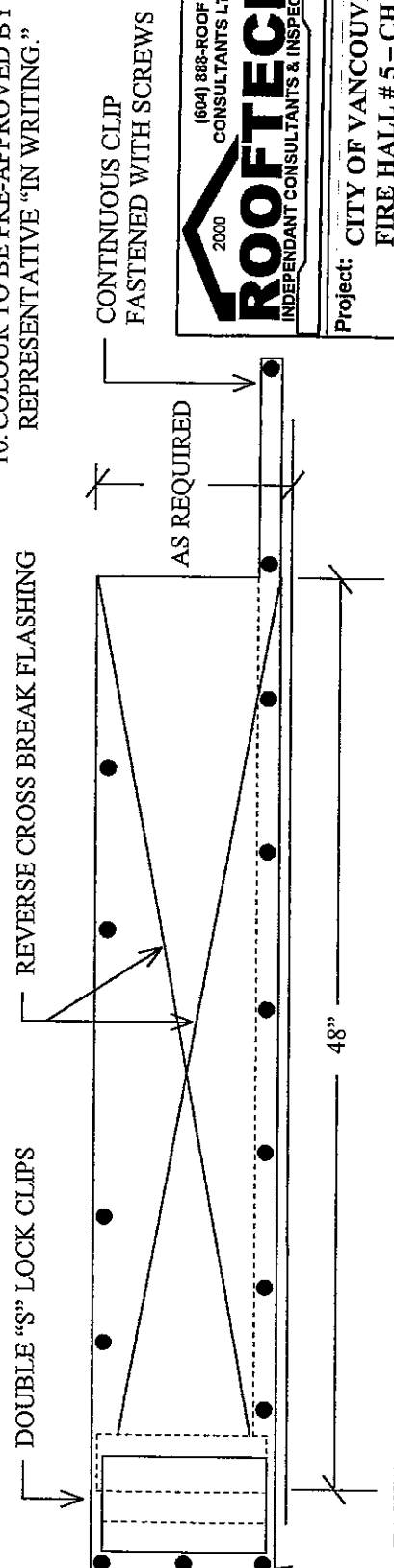
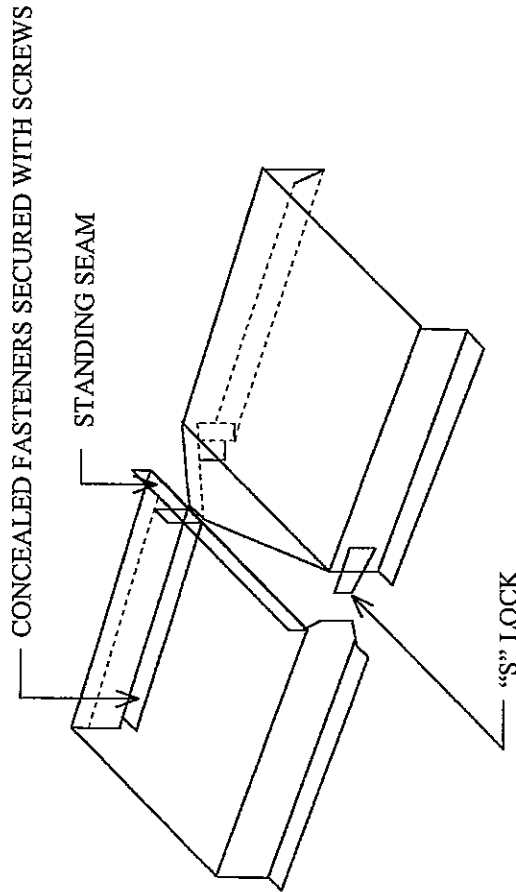
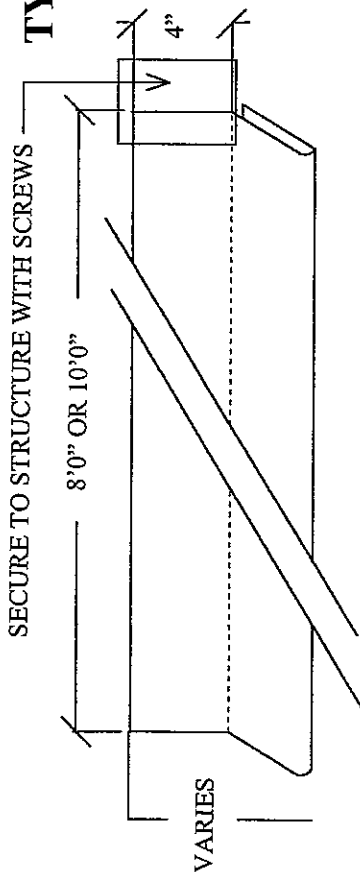
.2 To be manufactured to comply with current British Columbia Building Code Plumbing requirements.

.3 Settlement / vandal proof caps to be appropriately sized, if applicable.

.5 All flashings to conform to SMACNA standards or better.

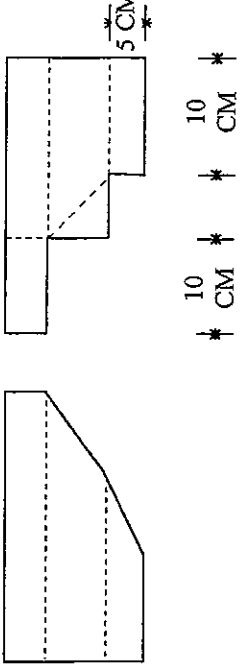
TYPICAL SHEET METAL INSTALLATION CRITERIA

1. ALL METAL SHALL HAVE PROPER ALLOWANCE FOR EXPANSION & CONTRACTION.
2. NO LAP JOINTS WILL BE PERMITTED.
3. ALL METAL TO BE JOINED BY LOCK CLIPS OR STANDING SEAM; SEE DETAILS.
4. ALL CAP FLASHINGS TO BE FASTENED WITH 24 GAUGE CLIPS AT 24" CENTRE LINES.
5. ALL JOINTS ARE TO BE CAULKED BOTH PRIOR TO AND AFTER CONNECTING.
6. ALL EXPOSED EDGE FLASHINGS SHALL BE HEMMED TO FORM A DRIP EDGE.
7. ALL METAL TO BE FIRMLY ATTACHED TO THE STRUCTURE WITH COMPATIBLE WOOD SCREWS.
8. NO SHEET METAL IS TO HAVE A FLAT SURFACE.
9. ALL SHEET METAL DETAILS ARE TO BE CONFIRMED BY THE ROOFING CONSULTANT VIA SHOP DRAWINGS PRIOR TO MANUFACTURE.
10. COLOUR TO BE PRE-APPROVED BY OWNER'S REPRESENTATIVE "IN WRITING."



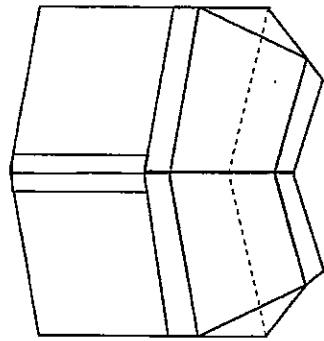
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|---|-----------------|
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| | Date: JUNE / 10 |
| Drawn by: JPJ | |
| Project: CITY OF VANCOUVER FIRE HALL # 5 - CHAMPLAIN 3090 EAST 54 TH AVE., VANCOUVER, BC YEAR 2010 RE-ROOF(S): RA # 1 & # 2 | |

INSIDE CORNER STRIPPING CRITERIA FOR 180G 3.0MM S.B.S. BASE SHEET

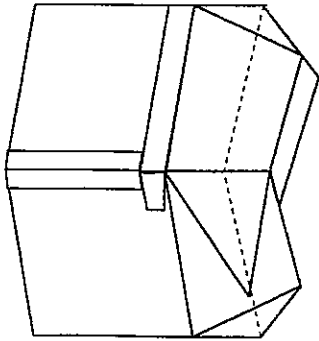


10 CM * * * * *
10 CM *

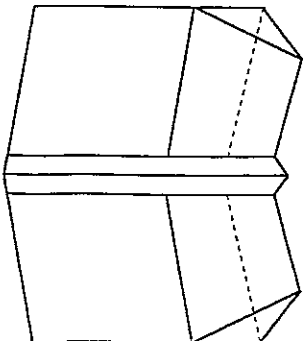
CORNER PATTERN FOR 180G 3.5MM
"S.B.S. BASE SHEET"
TORCH APPLIED WITH A 100% BOND



3

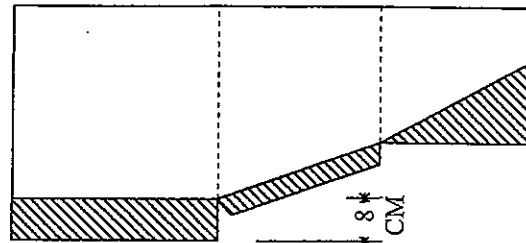
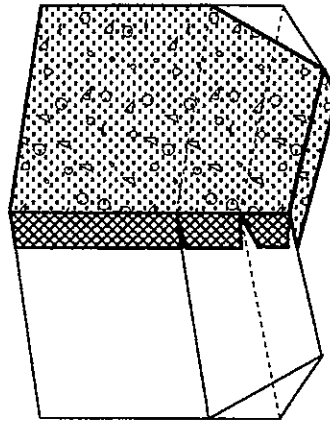
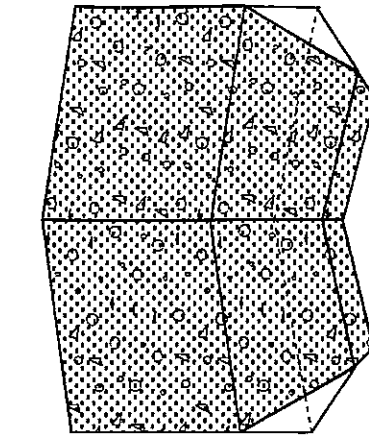


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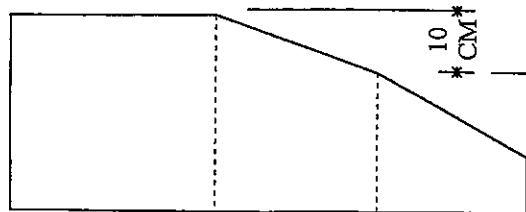
1

INSIDE CORNER STRIPPING CRITERIA FOR GRANULAR CAP SHEET



8 CM * * * * *
10 CM *

TYPICAL MEMBRANE INSIDE CORNER STRIPPING



10 CM * * * * *
15 CM *

CORNER PATTERN FOR 250G 4.0MM
"GRANULAR S.B.S. CAP SHEET"
TORCH APPLIED WITH A 100% BOND

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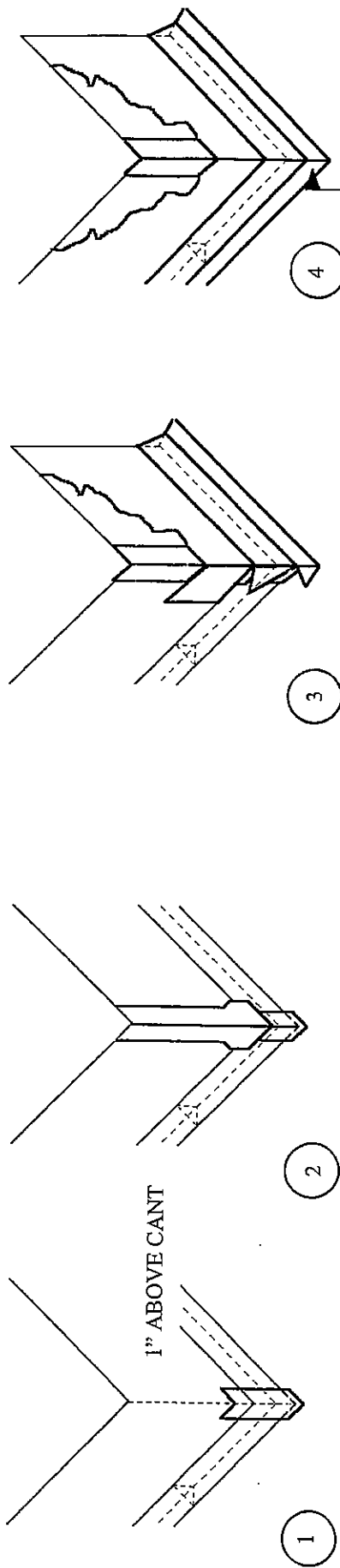
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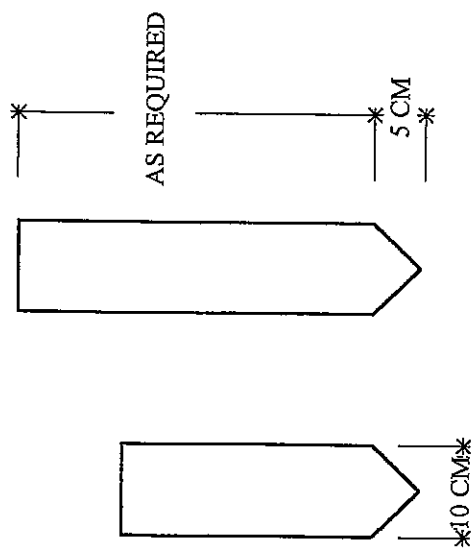
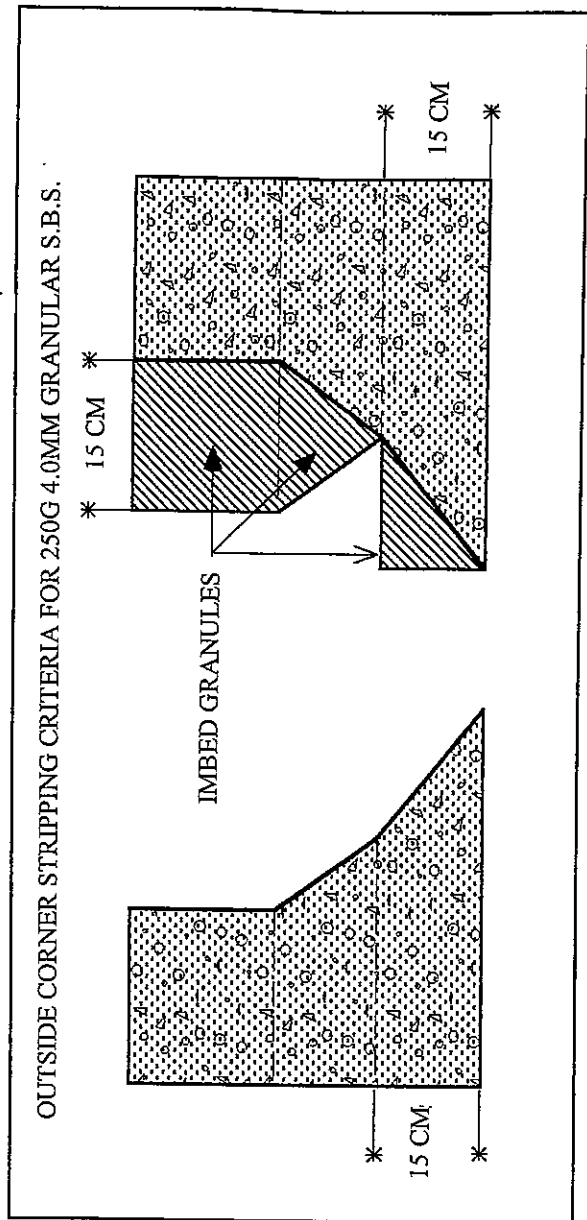
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CITY OF VANCOUVER
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OUTSIDE CORNER REINFORCEMENT & STRIPPING CRITERIA FOR 180G 3.0MM S.B.S.



OUTSIDE CORNER STRIPPING CRITERIA FOR 250G 4.0MM GRANULAR S.B.S.



TYPICAL OUTSIDE CORNER REINFORCEMENT & STRIPPING CRITERIA

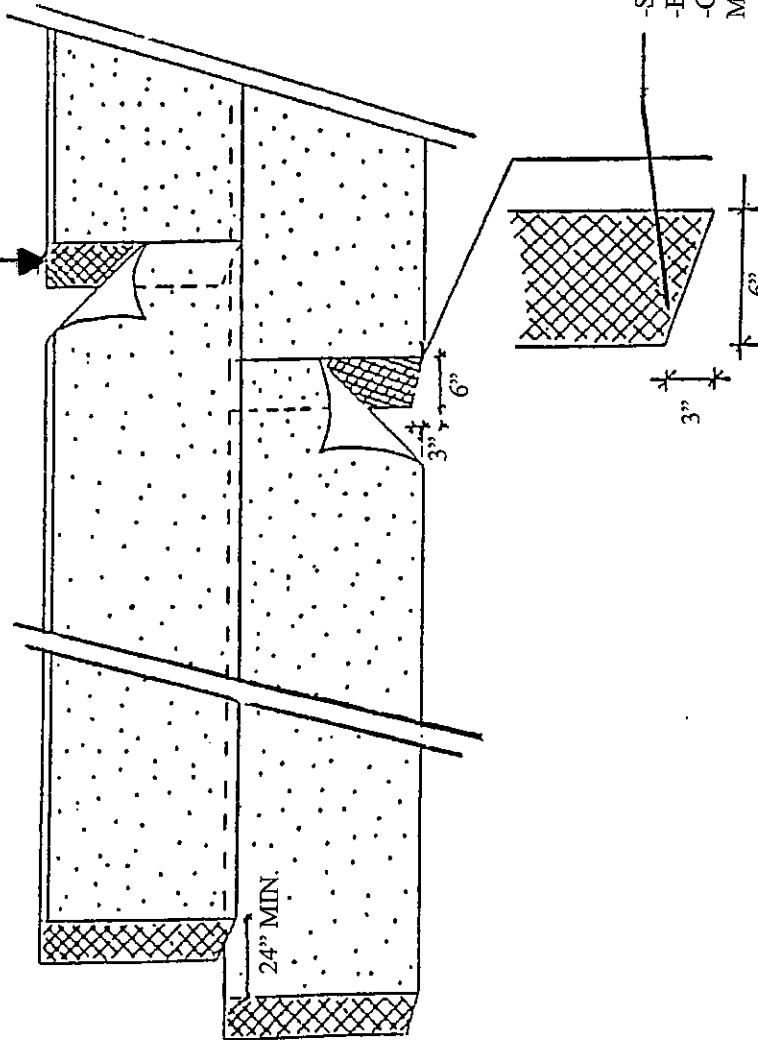
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CITY OF VANCOUVER
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YEAR 2010 RE-ROOF(S); RA # 1 & # 2

HEAT TOP SURFACE & EMBED GRANULARS INTO MEMBRANE PRIOR TO ADHESION OF OVERLAP PLY

STAGGER END LAPS 24"
250 (GRANULAR) MEMBRANE,
TORCH WELDED



HANDLING CRITERIA
 ALL ROLLS ARE TO BE UNROLLED & ALLOWED TO RELAX PRIOR TO INSTALLATION ON TO THE ROOF. TIME REQUIRED FOR RELAXATION IS DEPENDANT UPON WEATHER & MANUFACTURER. CRITERIA IS SMOOTH WRINKLE FREE BOND
 NOTE: HANDLING CRITERIA TO APPLY TO ALL 180G MEMBRANE

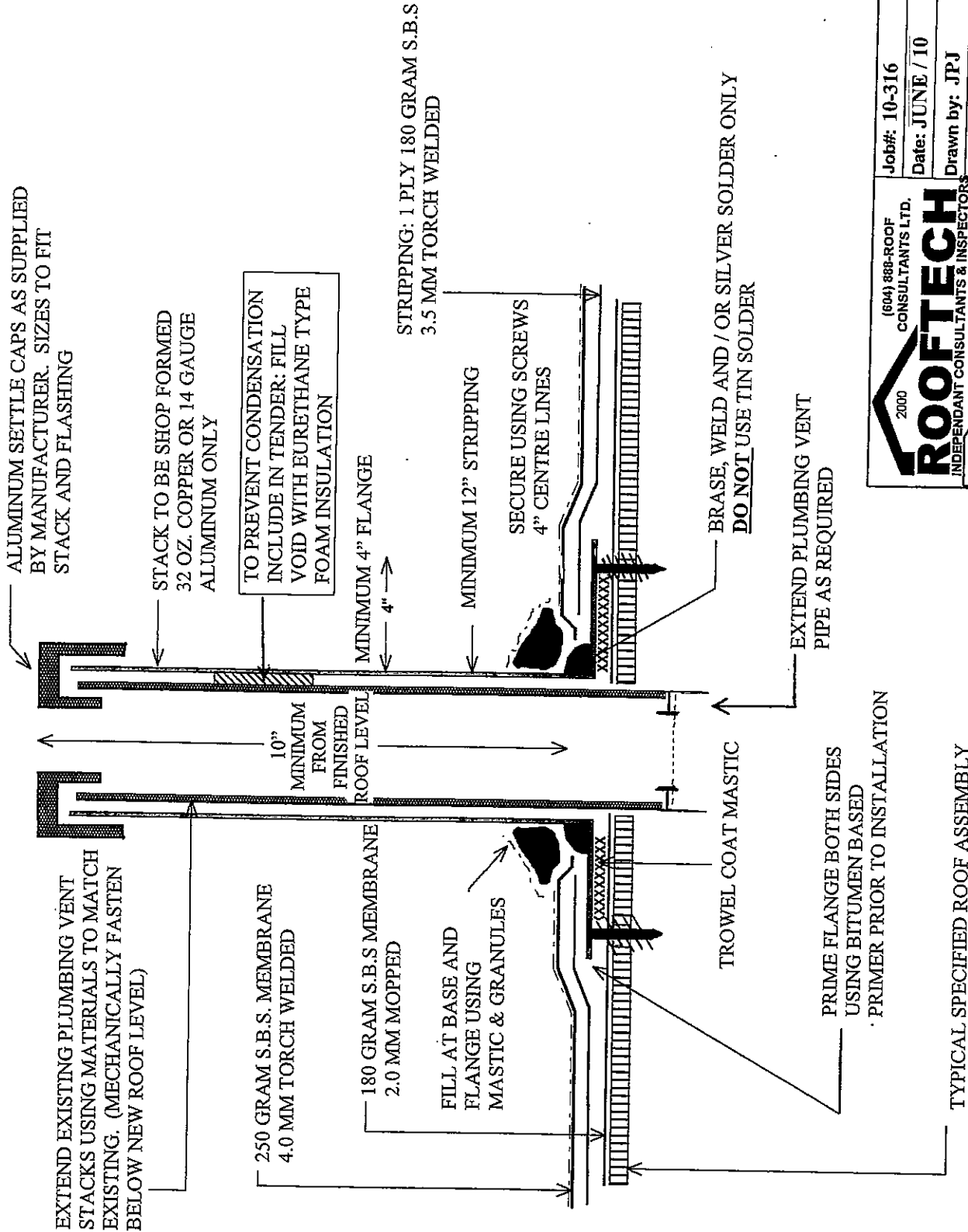
-SIDE LAPS 3"
 -END LAPS 6"
 -CUT IN AN ANGLE AT CORNERS OF THE MEMBRANE THAT WILL BE COVERED

GRANULATED CAP SHEET LAYOUT CRITERIA

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ALUMINUM SETTLE CAPS AS SUPPLIED BY MANUFACTURER. SIZES TO FIT STACK AND FLASHING

STACK TO BE SHOP FORMED 32 OZ. COPPER OR 14 GAUGE ALUMINUM ONLY

TO PREVENT CONDENSATION INCLUDE IN TENDER: FILL VOID WITH EURETHANE TYPE FOAM INSULATION

STRIPPING: 1 PLY 180 GRAM S.B.S. 3.5 MM TORCH WELDED

MINIMUM 12" STRIPPING

SECURE USING SCREWS 4" CENTRE LINES

BRASE, WELD AND / OR SILVER SOLDER ONLY **DO NOT USE TIN SOLDER**

EXTEND PLUMBING VENT PIPE AS REQUIRED

EXTEND EXISTING PLUMBING VENT STACKS USING MATERIALS TO MATCH EXISTING. (MECHANICALLY FASTEN BELOW NEW ROOF LEVEL)

250 GRAM S.B.S. MEMBRANE 4.0 MM TORCH WELDED

180 GRAM S.B.S. MEMBRANE 2.0 MM MOPPED

FILL AT BASE AND FLANGE USING MASTIC & GRANULES

TROWEL COAT MASTIC

PRIME FLANGE BOTH SIDES USING BITUMEN BASED PRIMER PRIOR TO INSTALLATION

TYPICAL SPECIFIED ROOF ASSEMBLY

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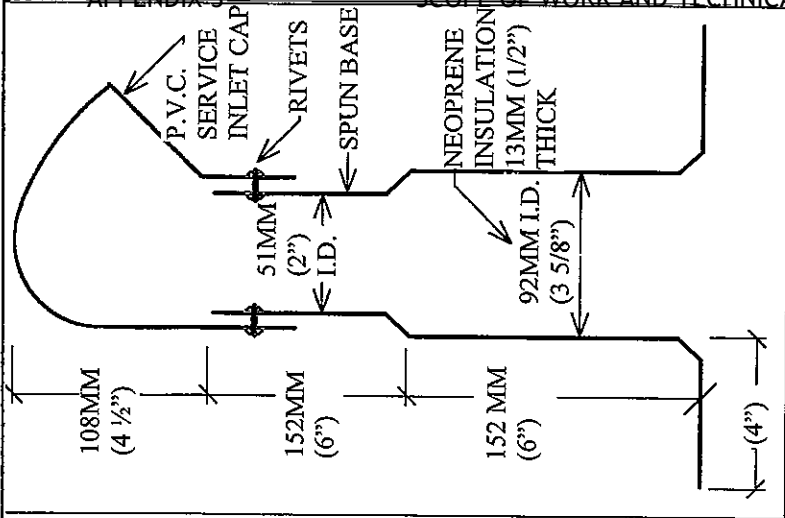
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CITY OF VANCOUVER
 FIRE HALL # 5 - CHAMPLAIN
 3090 EAST 54TH AVE., VANCOUVER, BC
 YEAR 2010 RE-ROOF(S): RA # 1 & # 2

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NOT TO SCALE: Existing measurements & profiles NOT for Tender purposes. Contractor to confirm all site data.

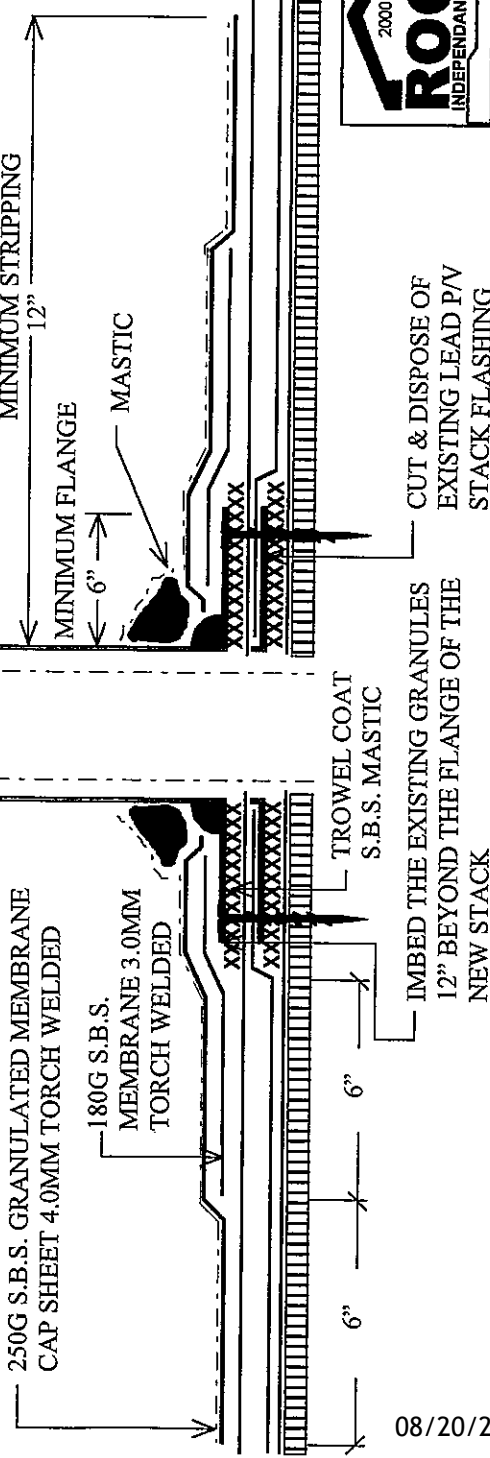
TYPICAL PLUMBING VENT FLASHING



SHOP FORMED HOOD
32 OZ. COPPER OR 14 GA.
ALUMINUM OR WRAP
USING 1.2MM E.P.D.M. &
CALVANIZED CLAMPS

STACK & FLANGE TO BE
SHOP FORMED 32 OZ. COPPER
OR 14 GA. ALUMINUM ONLY

NOTE:
EXISTING ELECTRICAL & / OR PIPE
TO BE EXTENDED AS NECESSARY TO
SUIT SITE CONDITIONS & CODES.
INCLUDE ALL RELATED COSTS IN
TENDER.



08/20/20

**TYPICAL DETAIL
ELECTRICAL & / OR GAS FLASHING REPLACEMENT**

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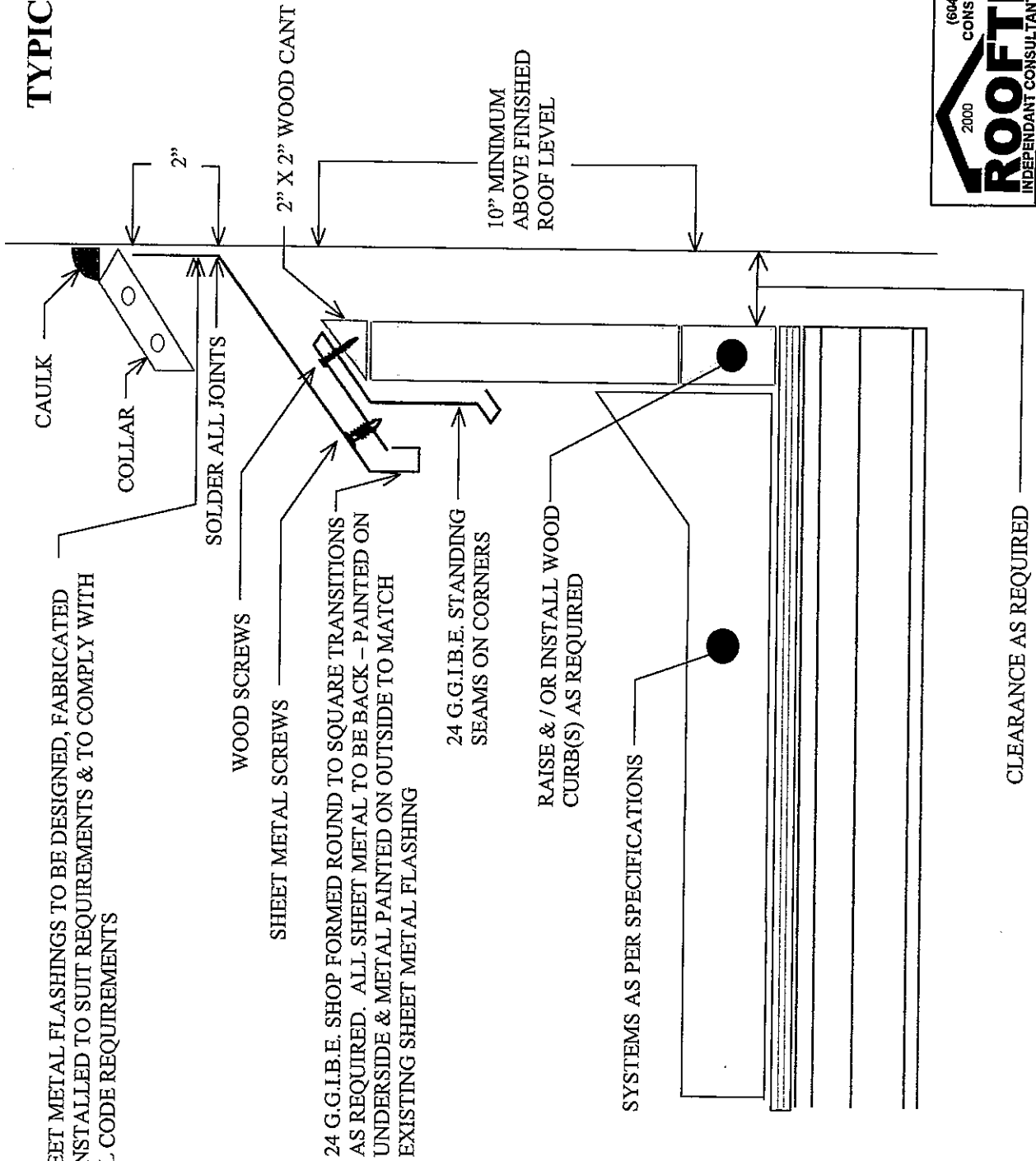
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TYPICAL CURB DETAIL



SHEET METAL FLASHINGS TO BE DESIGNED, FABRICATED & INSTALLED TO SUIT REQUIREMENTS & TO COMPLY WITH ALL CODE REQUIREMENTS

WOOD SCREWS

SHEET METAL SCREWS

24 G.G.I.B.E. SHOP FORMED ROUND TO SQUARE TRANSITIONS AS REQUIRED. ALL SHEET METAL TO BE BACK - PAINTED ON UNDERSIDE & METAL PAINTED ON OUTSIDE TO MATCH EXISTING SHEET METAL FLASHING

24 G.G.I.B.E. STANDING SEAMS ON CORNERS

RAISE & / OR INSTALL WOOD CURB(S) AS REQUIRED

SYSTEMS AS PER SPECIFICATIONS

10" MINIMUM ABOVE FINISHED ROOF LEVEL

2" X 2" WOOD CANT

2"

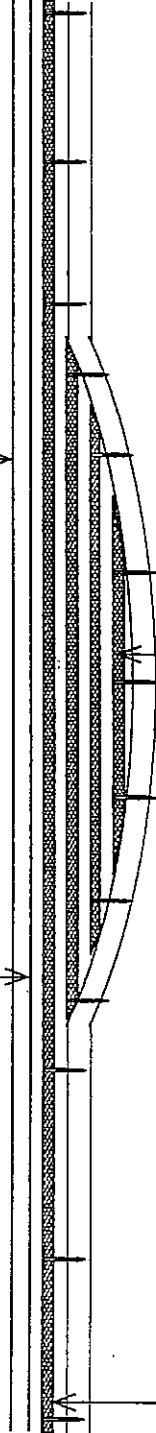
CLEARANCE AS REQUIRED

| | |
|---|-----------------|
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NOTE: EXTEND ALL PIPE TO EQUAL EXISTING & INSULATE AS REQUIRED. INCLUDE ALL COSTS IN TENDER

250 GRANULATED CAP SHEET 4.0 mm. S.B.S. MOD BIT POLYESTER TORCH WELDED.

180 / 3.5 mm. S.B.S. MOD BIT POLYESTER BASE SHEET TORCH WELDED.



PERMABOARD HAL INDUSTRIES OR EQUAL STAGGERED AND SECURED WITH LARGE HEAD ROOFING NAILS @ 18" CENTER LINE.

TO REDUCE PONDING INFILL WITH LAYERS OF PERMABOARD SECURED TO DECK WITH NAILS & INTER-PLY WITH TORCH WELDING INCLUDE IN TENDER TO PROVIDE TWO (2) SHEETS PER SQUARE OF PERMABOARD TO BE USED AS REQUIRED.

TYPICAL PONDING REDUCTION DETAIL: "NON-INSULATED SYSTEM CONTENTS"

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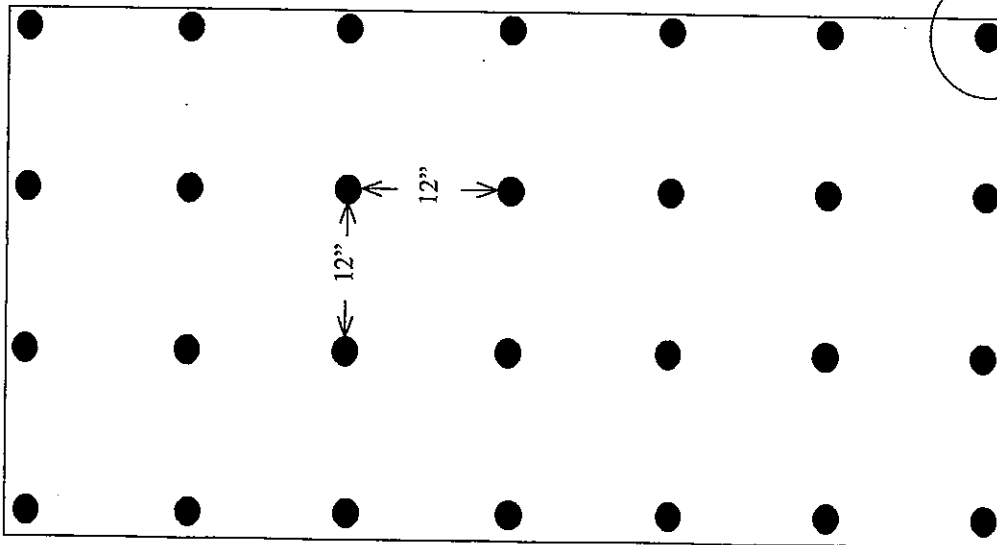
Drawn by: JPJ

Project: CITY OF VANCOUVER

FIRE HALL # 5 - CHAMPLAIN

3090 EAST 54TH AVE., VANCOUVER, BC

YEAR 2010 RE-ROOF(S): RA # 1 & # 2



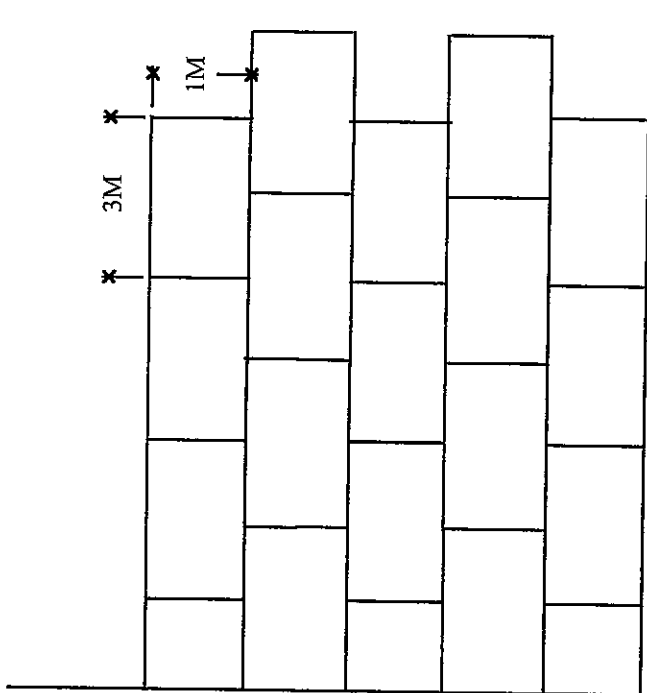
NAILING PATTERN PER
1M X 3M PERMABOARD

NAIL 1" FROM
PERIMETERS

1" HEAD



SPIRAL
SHANK
NAILS



TYPICAL:
PERMABOARD APPLICATION ALL JOINTS STAGGERED
& ALL JOINTS & PENETRATIONS TAPED

PERMABOARD OR EQUAL APPLICATION & NAILING PATTERN

| | |
|---|-----------------|
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NOT TO SCALE: Existing measurements & profiles NOT for Tender purposes. Contractor to confirm all site data.

1.



2.



3.



4.



5.



6.



7.



8.



9.



10.



11.



12.



13.



14.

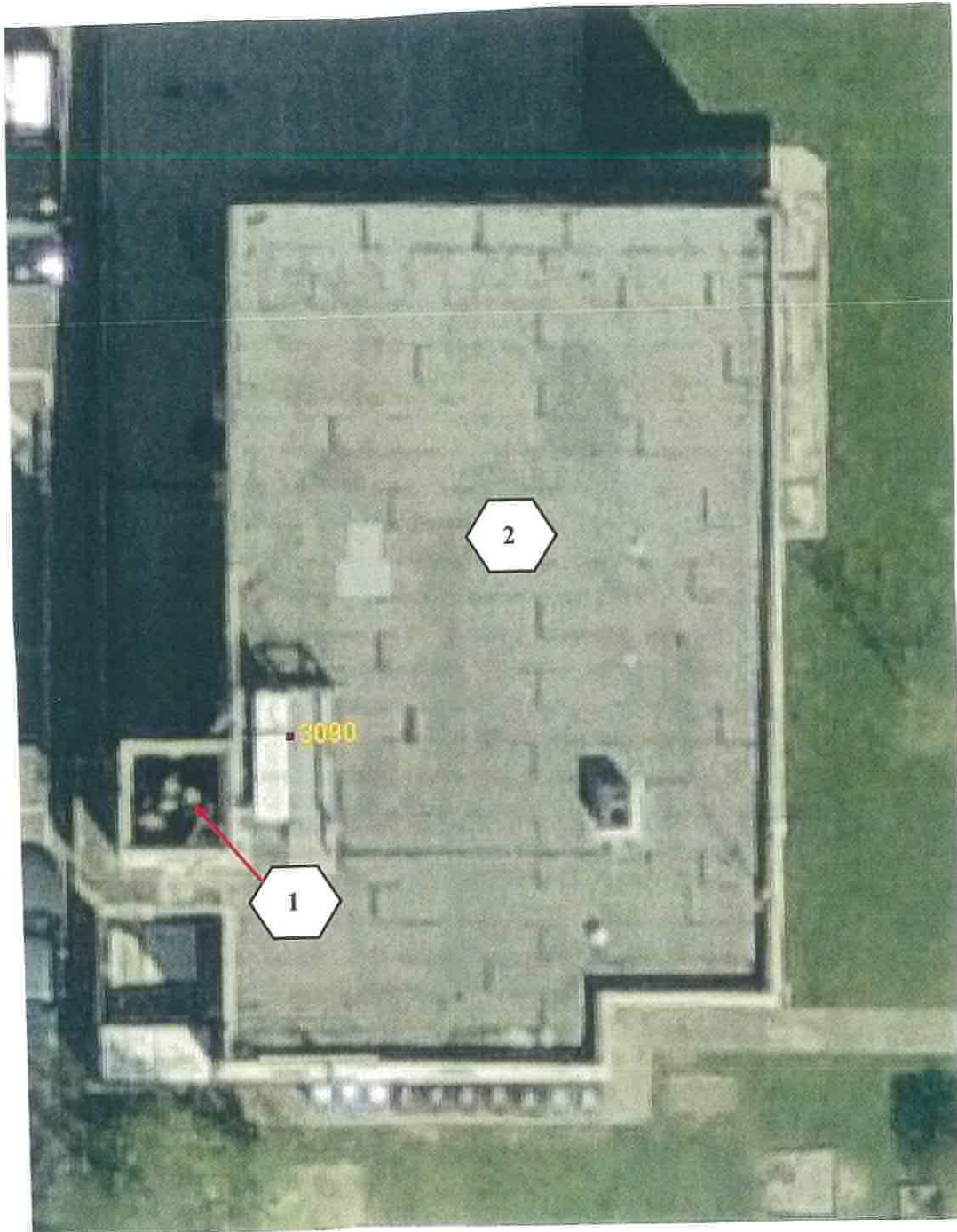


15.



16.





| | | |
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| | | Drawn by: |
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